

## Bowland assessment materials

Assessing the Key Processes with rich and engaging tasks



The role of assessment is to see how far a student's responses match performance goals in mathematics, summarised by:

*"Proficient students of all ages expect mathematics to make sense. They take an active stance in solving mathematical problems. When faced with a non-routine problem, they have the courage to plunge in and try something, and they have the procedural and conceptual tools to carry through. They are experimenters and inventors, and can adapt known strategies to new problems. They think strategically."*

(from the recent USA Common Core State Standards)

Most common forms of assessment only address one phrase in the above paragraph, assessing whether "they have the procedural and conceptual tools". The recent Programme of Study for Key Stage 3 describes in some detail, under the heading of *Key Processes*, the elements of performance that have been missing.

The Bowland Case Studies engage pupils' interest in mathematics, and help them develop the ability to apply their mathematical knowledge to rich and diverse problems. This is essential if pupils are to become proficient in these *Key Processes*.

But how can this proficiency be assessed?

### Bowland self-contained assessment tasks



Bowland Maths now includes over thirty tasks designed to help you assess your pupils' achievements and progression against the Key Processes defined in the Key Stage 3 National Curriculum. To help you with this assessment, each task comes with sample pupils' work, and a "progression table" showing how pupils' work on this task can provide evidence of their progress with the four Key Processes. These self-contained tasks take between twenty minutes and an hour.

These materials are also ideal for *formative assessment* that concentrates on providing the types of rich feedback that have been proven to help pupils improve their reasoning.

These materials are now available via the Bowland Player at <http://www.bowlandmaths.org.uk>

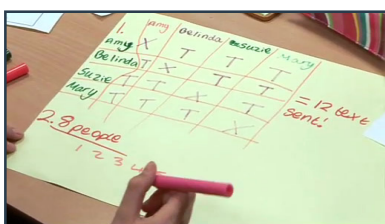
## Assessing the Case Studies



For seven of the most popular Case Studies, we have developed comprehensive guides to help you assess your pupils' achievement and progression as they work on the activities and to relate this to the Key Processes defined in the Key Stage 3 National Curriculum. As you gain familiarity with these assessment techniques, you should be able to apply them to the other Case Studies.

These guides will be available from the Bowland Maths website.

## Applying Mathematical Processes (AMP) materials – Nuffield Foundation



The Nuffield Foundation has developed new resources, consisting of 20 *Applying Mathematical Processes* (AMP) activities to support the teaching and assessment of key processes in mathematics. Bowland and Nuffield have worked together to ensure that the new resources have a coordinated approach. Similar advice and guidance for teachers is given for each Bowland assessment task and Nuffield AMP activity.

The AMP activities are updated versions of some investigations and practical problems from the *Graded Assessment in Mathematics* (GAIM) resources, originally developed in the 1980s.

These materials can be found on the Nuffield website at <http://www.nuffieldcurriculumcentre.org/>

## Professional development on assessing the Key Processes



Assessing pupils' progress as they develop the Key Processes is far from straightforward. To help you use these materials in your classroom, there are two new Professional Development modules focussing on assessment of the Key Processes.

The first module – *Assessing Key Processes to inform learning* – considers the different ways this can be done and discusses the following questions:

- How can Bowland assessment tasks be used to assess performance and progression in the Key Processes?
- How can this assessment be used to promote learning?
- What kinds of feedback are most helpful for pupils and which are unhelpful?
- How can assessment information be used to provide evidence for periodic assessment?

The second module – *Involving pupils in self- and peer- assessment* – explores how pupils can assess and develop their own abilities to use the Key Processes when problem solving. Self and peer assessment have the potential to help pupils become more aware of the goals of their learning and of the ways in which they can improve their own work to achieve these goals. This module addresses the following questions:

- How can we help pupils to become aware of the Key Processes, and their importance in problem solving?
- How can we encourage pupils to take more responsibility for their own learning of Key Processes?
- How can pupils be encouraged to assess and improve each other's work?

Both of these modules are, like the earlier Bowland professional development, designed as "sandwich" sessions – an introductory session raises the issues, after which teachers plan and deliver an assessment lesson in their own classroom. Then, in a follow-up session, teachers review their lessons and discuss the implications. The modules include extensive video of teachers trying the materials in their own classroom and discussing the results. The focus is always on allowing professional teachers to discuss and explore the issues rather than dictating 'best practice', though there are plenty of suggestions.